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Published in:
Psychology, Health & Medicine

DOI:
10.1080/13548506.2017.1338736

Published: 01/02/2018

Document Version
Peer reviewed version

The effects of perceived social norms on handwashing behaviour in students

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Keywords: social norms theory, handwashing, students, health behaviour

Abstract

University students may be at increased risk of infection because of living and working in close proximity to one another. Hand washing is widely considered the most effective method of preventing the spread of infectious illness. Exploring the determinants of hand washing is vital to the development of interventions to increase this behaviour. A survey based on Social Norms Theory assessed hand washing frequency and perceptions of peer hand washing in 255 students at a Scottish University. Participants reported their own hand washing frequency and rate, and how often they thought their peers washed their hands in particular circumstances, to determine whether misperceptions around hand washing exist in a UK student population, and whether these influence the behaviour of individuals. Gender was found to be a significant determinant of hand washing frequency as females reported washing their hands significantly more often than males. Participants also believed they washed their hands significantly more frequently than their peers. Using hierarchical linear regression modelling, it was determined that perceived peer hand washing frequency significantly predicted participants' own behaviour. This effect was seen in overall hand washing and in food, waste and illness-related hand washing. These results suggest perceived social norms around hand washing have a consistent and robust effect on individual behaviour. An intervention based on Social Norms Theory may, therefore, be effective in increasing hand washing in a student population, reducing infection spread and illness rates within this group. Future research might test the effectiveness of a social norms intervention in other settings which carry an increased risk of infection spread, for example schools, hospitals and care homes.

Handwashing is the most successful way of preventing the spread of infectious illnesses. An increased risk of infection spread is apparent among populations who live and work in close proximity to one another, such as University students (White et al., 2003). Effective handwashing could reduce the spread of infection and decrease illness rates within this population by breaking the chain of infection; however, research has shown that handwashing rates tend to be relatively low among students (Ergin et al., 2011; Thumma et al., 2009).

Social factors may be important drivers of health behaviour engagement, and several theoretical approaches, e.g. social norms theory (SNT; Berkowitz & Perkins, 1987), the theory of reasoned action (Ajzen & Fishbein, 1980), focus theory (Cialdini, Reno & Kallgren, 1990), and the theory of normative social behaviour (Rimal & Real, 2005), consider the role of social norms. SNT examines the beliefs individuals hold about how frequently their peers engage in particular behaviours, and the effect these have on their own behaviour. Berkowitz (2005) reviewed the social norms literature and found that people typically overestimate the frequency of others' unhealthy behaviours and underestimate healthy behaviours. This may help to rationalise unhealthy behaviour, as individuals perceive this as common amongst their peer group, and inhibit healthy practices (e.g., handwashing).

While the majority of SNT research has concentrated on alcohol consumption (e.g., Perkins, 2007), handwashing in students has recently been the focus of a small number of studies (e.g., Lapinski, Maloney, Braz and Shulman, 2013; Miko et al., 2013). Mackert, Liang and Champlin (2013) found that students reported that they washed their hands after using the bathroom 88% of the time but estimated that their peers only washed theirs 58.6% of the time. Importantly, this study also found that perceptions of peer handwashing were significant predictors of participants' own handwashing behaviour. However, little research has considered handwashing across different situations where handwashing is important. The present study aims to address this gap by investigating the perceptions university students' hold of their peers' handwashing behaviour across contexts, and whether these beliefs are associated with students' own behaviour. As SNT research consistently highlights gender differences (e.g., Borchgrevink, 2013; Ergin et al., 2011), it is hypothesised that rates of self-reported handwashing will be higher in females than in males. Also in line with previous research (Miko et al., 2013; Lapinski et al., 2013), it is expected that students will

believe their own hand hygiene is better than that of their peers, indicating that misperceptions exist around this behaviour.

Method

Participants

255 students aged 17-55 years (M = 23.93 years; SD= 7.16) at a Scottish University (184 females), completed an online questionnaire.

Materials and Procedure

Ethical approval was obtained from the local ethics committee. A SNT based questionnaire was compiled which contained 39 questions adapted from other questionnaires (Scott and Vanick, 2007; Miko et al., 2013) and the Centres for Disease Control and Prevention (2015) handwashing guidelines. The first question assessed group identification (see below) and the remaining 38 questions formed two sub-scales (19 questions each). The first sub-scale assessed participants' own handwashing frequency in particular circumstances (e.g. "how often do you wash your hands after using the bathroom?", "how often do you wash your hands before eating?", "how often do you wash your hands after blowing your nose?"). Participants responded using a 5 point Likert scale (0-4) with "never", "rarely", "sometimes", "most of the time" and "always". The mean of these responses was calculated to give a handwashing score. The second sub-scale asked participants to rate how often they think their peers washed their hands in these situations. The mean of these scores was calculated to provide a perceived peer handwashing score, representing students' perceived social norms. These sub-scales were found to be highly reliable (students' own behaviour: α= .90; perceived peer behaviour: α= .89).

Group Identification

To ensure an appropriate peer group was identified for each participant (Mahalik et al., 2007) participants were asked to rate to what extent they agreed or disagreed with the statement "Being a student at University is an important part of my identity". If participants

answered "strongly agree" or "agree" to this question, the social norms questions they were asked concerned the behaviour of other University students. If they answered "strongly disagree" or "disagree", they were asked about the behaviour of their friends. An independent samples t-test revealed no significant difference between perceptions of peer handwashing frequency reported by participants who answered social norms questions regarding other students (M= 2.23, SD=.55) or their friends (M= 2.29, SD=.51) (t (253) = -.732, p= .465); therefore, these measures were combined and will be referred to as "peer" handwashing scores.

Statistical Analysis

A Shapiro-Wilk test found that participants own handwashing scores were not normally distributed therefore non parametric statistics were used. A Wilcoxon Signed Ranks test was used to determine whether participants rated their own handwashing frequency as different to that of their peers. To determine whether social norms and participants own behaviours are related a series of correlation analyses were conducted. Composite variables were created by grouping responses into "food", "waste" and "illness" related handwashing, and questions concerning peer behaviour in these situations made up the corresponding social norms scales. The internal reliability of these composite scales were: students' own behaviour: food (α= .77), waste (α=.61), illness (α=.82). Perceived peer behaviour: food (α= .75), waste (α=.72), illness (α=.80).

Results

As shown in Table 1, a Mann Whitney U test revealed that females (Mdn = 2.84, r = 2.68) had significantly higher handwashing frequency scores than males (Mdn = 2.63, r = 3.21) (U = 5462.50, p = .043). However, no gender differences were observed in perceived social norms and age was not significantly correlated with handwashing (or perceptions of peer handwashing).

[Insert Table 1]

A Wilcoxon Signed Ranks test revealed that participants rated their own handwashing (*Mdn* = 2.79, *r* = 3.21) as significantly more frequent than that of their peers (*Mdn* = 2.21, *r* = 3.46), (*Z* = -11.12, *p* <.001). This result was then broken down to analyse individual behaviours (see Table 2). These analyses showed that self-reported handwashing was significantly higher than estimated peer handwashing for all assessed behaviours.

[Insert Table 2]

A 2x3 Repeated Measures ANOVA showed significant main effects of handwasher identity (i.e. self vs peer): ($F(1, 254)=386.27$, $p <.001$) and of handwashing context (i.e. food, waste, illness): ($F(2, 508)=42.17$, $p <.001$). The interaction between handwasher identity and handwashing context was also significant ($F(2, 508)=109.49$, $p <.001$). Follow up simple effects analysis revealed that people believed that their own handwashing was better than that of their peers in the contexts of food: ($t(254)=14.50$, $p <.001$), waste: ($t(254)=14.65$, $p <.001$), and illness: ($t(254)=10.09$, $p <.001$).

As shown in Table 3, students' self-reported handwashing was significantly correlated with their perceptions of the handwashing frequency of their peers when in contact with food: ($r(255)= .47$, $p <.001$), waste: ($r(255)= .41$, $p <.001$), and illness: ($r(255)= .50$, $p <.001$). In all cases, more frequent self-reported handwashing was related to a higher perception of peer handwashing.

[Insert Table 3]

Discussion

We found that participants believed they washed their hands more frequently than their peers. Overall handwashing was associated with perceived social norms, and perceptions of peer handwashing around food, waste and illness were significantly associated with participants' own handwashing in these contexts. The finding that females reported better hand hygiene than males is consistent with survey findings with students (Thumma et al., 2009; Ergin et al., 2011) and the general population (Rubin et al., 2009). Also consistent with previous research (Lapinski et al., 2013; Miko et al., 2013) was the finding that participants believed their own handwashing was more frequent than that of their peers; however, it is

possible that self-reported handwashing may be exaggerated due to the social desirability of this behaviour (Surgeoner et al., 2009).

We found that perceptions of peer handwashing frequency were associated with participants' own behaviour. This has also been reported in a US student population (Mackert et al., 2013) and perceived social norms were found to predict a number of health behaviours in a non-student male sample (Mahalik et al., 2007). The present study extends previous research by showing that handwashing around food, waste and illness were all significantly predicted by perceptions of peer handwashing frequencies in these contexts. This provides evidence that SNT is a valuable theoretical standpoint from which to investigate and influence this behaviour across contexts.

This was a cross-sectional study meaning that we cannot infer causality regarding the relationship between social norms and handwashing behaviour. There are both strengths and limitations associated with the questionnaire. Questions were adapted from published social norms research and official guidelines regarding handwashing, and behaviour was assessed across a range of contexts to obtain a comprehensive picture. However, the questionnaire was not tested for reliability or validity before use (although we found the internal consistency of the measures to be good in the current sample).

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Table 1: Self-Reported Hand Washing Frequency and Perceived Peer Behaviour Scores in the Contexts of Food, Waste and Illness

Gender	Overall	Illness	Food	Waste
Self-Reported Hand Washing Behaviour Scores				
Male (N=71)	2.63 (3.21)	2.33 (4.00)	3.00 (3.00)	3.00 (2.75)
Female (N=184)	2.84 (2.68)	2.83 (3.67)	3.20 (3.00)	3.25 (3.00)
Total (N=255)	2.79 (3.21)	2.67 (4.00)	3.20 (3.00)	3.25 (3.00)
Peer Hand Washing Behaviour Scores				
Male (N=71)	2.21 (3.46)	2.00 (4.00)	2.40 (3.00)	2.50 (3.75)
Female (N=184)	2.21 (2.68)	2.17 (3.33)	2.40 (3.00)	2.25 (3.50)
Total (N=255)	2.21 (3.46)	2.00 (4.00)	2.40 (3.20)	2.25 (3.75)

Note: Median scores reported and range in parentheses

Table 2: Wilcoxon Signed Ranks Tests Comparing Students' Self-Reported Hand Washing Behaviour and Perceived Frequency of Peer Hand Washing Across Three Contexts

	Food	**Waste**	**Illness**
Z	-10.980	-11.030	-8.759
Sig (2-tailed)	p <.001	p <.001	p <.001
Self-Reported Hand Washing Score	3.20 (3.00)	3.25 (3.00)	2.67 (4.00)
Perceived Peer Hand Washing Score	2.40 (3.20)	2.25 (3.75)	2.00 (4.00)

Note: Median scores reported and range in parentheses

Table 3: Correlations between Students' Self-Reported Hand Washing Behaviour and Perceived Frequency of Peer Hand Washing Across Three Contexts

	Food	**Waste**	**Illness**
r	.465	.414	.496
Sig (2-tailed)	p <.001	p <.001	p <.001
N	255	255	255